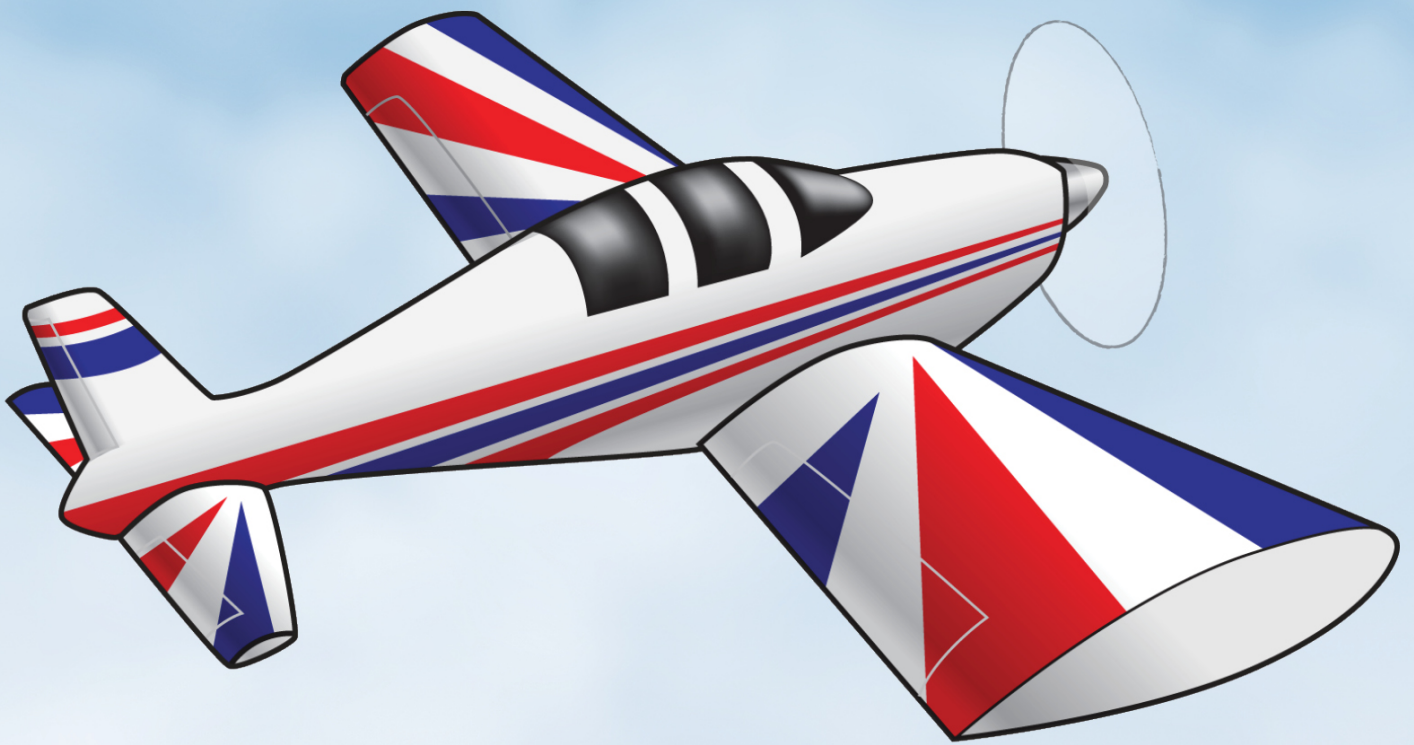


SCOTTISH RITE



*Take Flight:
A Comprehensive Curriculum for Students with Dyslexia*

Research Summary



Executive Summary

Take Flight: A Comprehensive Intervention for Students with Dyslexia was written by the education staff of the Luke Waites Center for Dyslexia and Learning Disorders at the Texas Scottish Rite Hospital for Children. *Take Flight* builds on the success of previous dyslexia intervention programs developed at Scottish Rite Hospital. Recent reading intervention studies, including data collected at the hospital, were the impetus for writing *Take Flight* and have contributed to its design. Teaching trials in Scottish Rite Hospital's Dyslexia Laboratory and with therapists in public schools also influenced curriculum development.

Key Findings

- **Students that completed *Take Flight* show significant growth in all areas of reading skill.**
- **Follow-up research on children who completed treatment indicated that students maintain the benefits of instruction on word reading skills and continued to improve in reading comprehension after one year.**
- ***Take Flight* is effective in schools when delivered to students with significant reading difficulties and implemented with fidelity by therapists with advanced training in treating learning disorders.**

Overview

Dyslexia, the most common specific learning disability, causes difficulties with reading and spelling in approximately ten percent of school age children. The definition of dyslexia has been modified with advances in research since the first consensus definition was formulated in 1968 at Scottish Rite Hospital by the World Federation of Neurology. The current definition specifies that children can be identified with dyslexia when they have problems accurately and efficiently sounding out (decoding) single words associated with difficulties processing the sound (phonological) structure of language. Slow, inaccurate word reading can lead to poor reading comprehension and is unexpected because most other cognitive and academic abilities are intact. The spelling problems of dyslexia contribute to difficulty acquiring proficiency in writing.

The hospital's staff began developing programs to help children with dyslexia improve their reading-related skills with the creation of *Alphabetic Phonics* (AP) in the mid-1960s. The central feature of AP and other phonologically-based programs is the systematic approach that is taken to establish a link between the alphabet and the language sounds (phonemes) it represents. In response to the 1985 state requirement for intensive instruction for students with dyslexia, our staff created the *Dyslexia Training Program* (DTP), an adaptation of AP, which utilized a video format to provide intensive phonics instruction to children who may not have access to trained dyslexia teachers. A study of the effectiveness of the DTP met the scientific standards necessary to be included in the report of the National Reading Panel. *Take Flight*, published in 2006, builds on the success of the DTP for teaching phonics skills, and has been modified to enable children with dyslexia to read more accurately, efficiently, and with better understanding.

The report of the National Reading Panel identified research-proven components of effective reading instruction to be phonemic awareness, phonics, fluency, vocabulary and reading comprehension. *Take Flight* was designed using the scientific evidence that supports the importance of each of these five components:

- **Phonemic awareness in *Take Flight* includes a systematic exploration of the articulation of phonemes and is fully integrated within decoding and spelling instruction.**
- **The phonics instruction of *Take Flight* was derived from the decoding component of the DTP. This instruction is now introduced at a faster pace in the lesson sequence, allowing more time for practice toward accuracy and automaticity and for more guided reading practice. An expanded use of etymology is also added to the lesson for teaching word analysis strategies.**
- **Vocabulary is expanded and enriched by developing morphological knowledge, word relationships, figurative language, syntax and semantics by direct instruction and in the context of reading.**
- **Fluency instruction incorporates guided and timed repeated reading of decodable words, phrases and connected text. Incentives, concrete measures of progress and daily home practice are also important elements of fluency training.**
- **A combination of scientifically-supported techniques is used for instruction in reading comprehension. These strategies include cooperative learning, comprehension monitoring, question generation, story structure, summarizing and inferencing. Students also learn how to utilize graphic and semantic organizers when reading narrative and expository texts.**

The five components are integrated within each daily lesson and presented across the entire lesson sequence contained in the seven books of the curriculum. In the first 35 lessons (Books 1 and 2) of *Take Flight*, two new grapheme-phoneme rules are introduced each day. This program directly integrates grapheme introduction, phonemic awareness and spelling. Students apply their phonics knowledge reading single words and sentences that combine each lesson's new rules with previously learned material. Each lesson has additional opportunity for practice of the new phoneme during direct phonemic awareness and spelling exercises.

The lesson cycle takes on a new look with Book 3. On alternating days, the lessons continue new grapheme-phoneme introductions with additional practice of all learned decoding rules. The alternate lessons provide the opportunity to practice previous learning through timed, repeated reading rate practice to improve reading fluency. These lessons also include comprehension strategy instruction and 20 minutes of oral reading of connected text that provides necessary practice for newly learned strategies.

With *Take Flight*, students will learn all 44 phonemes of the English language, 96 grapheme-phoneme correspondence rules and 87 affixes. The students will also learn spelling rules for base words and derivatives. Practice opportunities are also provided that are designed to improve oral reading fluency. Finally, *Take Flight* introduces comprehension and vocabulary building strategies for both narrative and expository text in the context of oral reading exercises, preparing students for successful, independent reading.

Descriptive Results of *Take Flight* Treatment

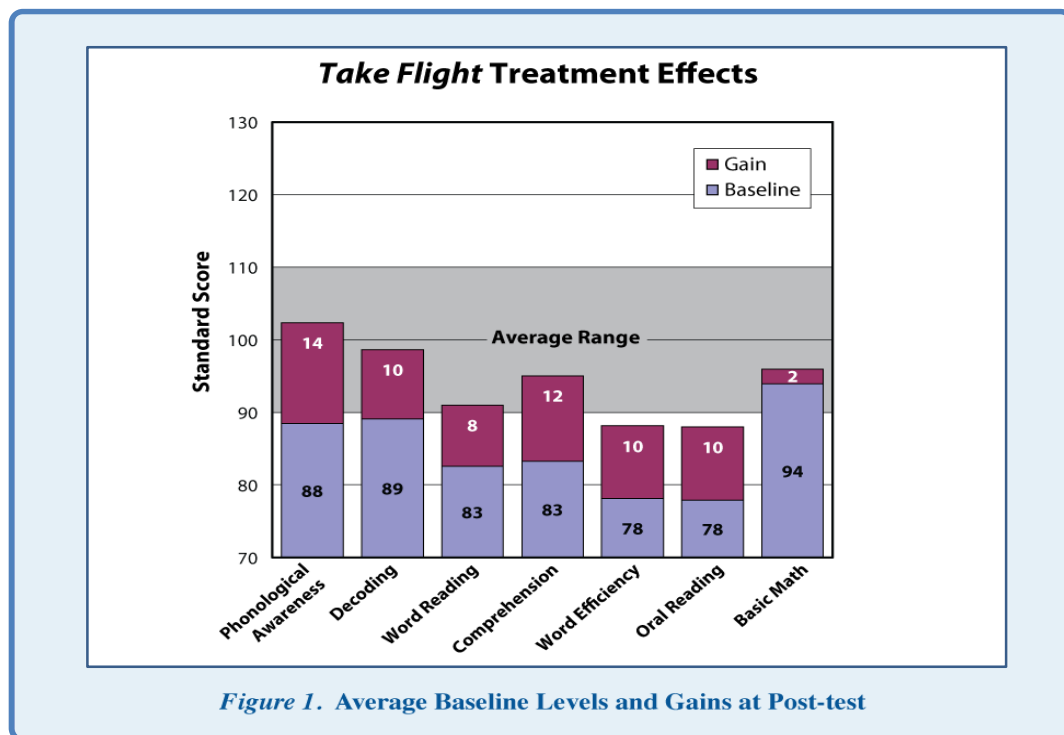
Before publishing *Take Flight*, researchers evaluated the effect the curriculum had on students attending the Hospital's Dyslexia Laboratory and dyslexia programs in public schools. Major findings are described and summarized below.¹

Details of the Dyslexia Laboratory at Scottish Rite Hospital

- Students come to the hospital for class four days per week for two academic years.
- Students participate in small group sessions for 90 minutes each day.
- Instruction at the laboratory is delivered by Academic Language Therapists.

Summary of *Take Flight* Treatment Effects

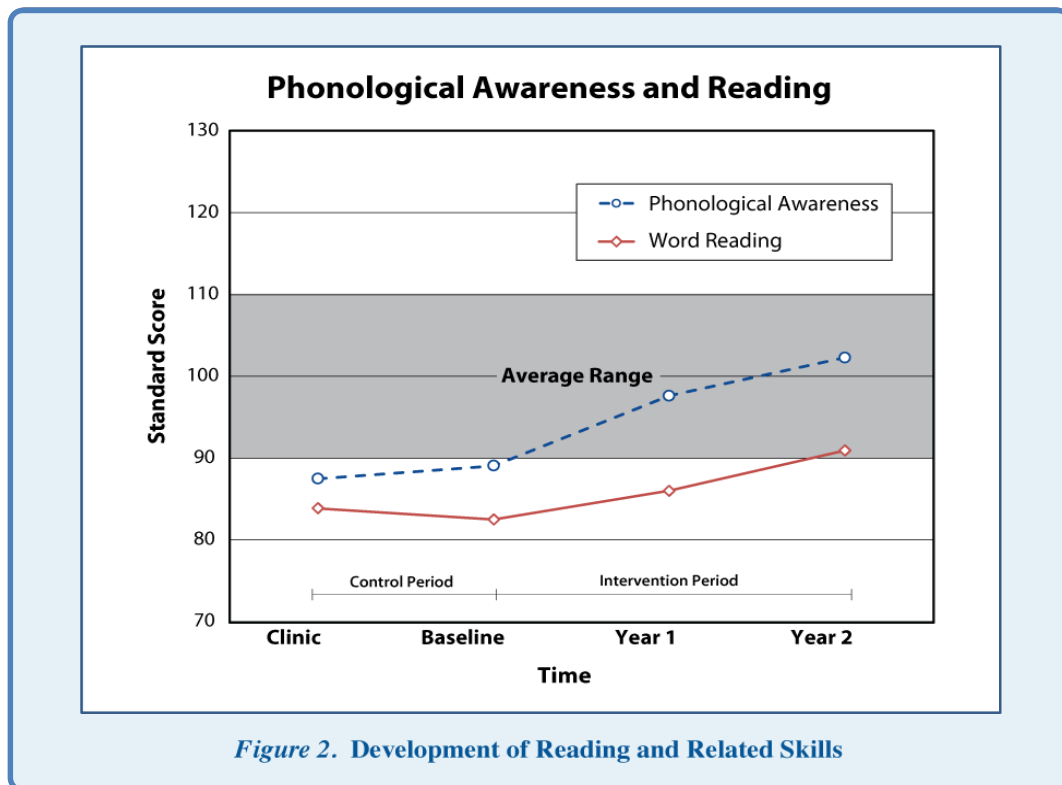
Data were collected from seven consecutive graduation groups at the Dyslexia Laboratory ($n = 113$). Students were tested at baseline and when treatment concluded at the end of the second year. Figure 1 shows summary statistics of average skill levels at the beginning of treatment and observed gains in phonological awareness², word decoding³, reading⁴, comprehension⁴, reading efficiency⁵, oral reading⁶ and math skills.⁴



- Baseline levels were below the average range in phonological processing and reading skills, particularly word and oral reading efficiency.
- Significant gains were recorded after treatment in phonological awareness and all reading skills, bringing the sample within, or near, the average range.
- The small gain in math skills suggests that observed treatment effects were specific to the domain of reading.

Summary of *Take Flight* Efficacy

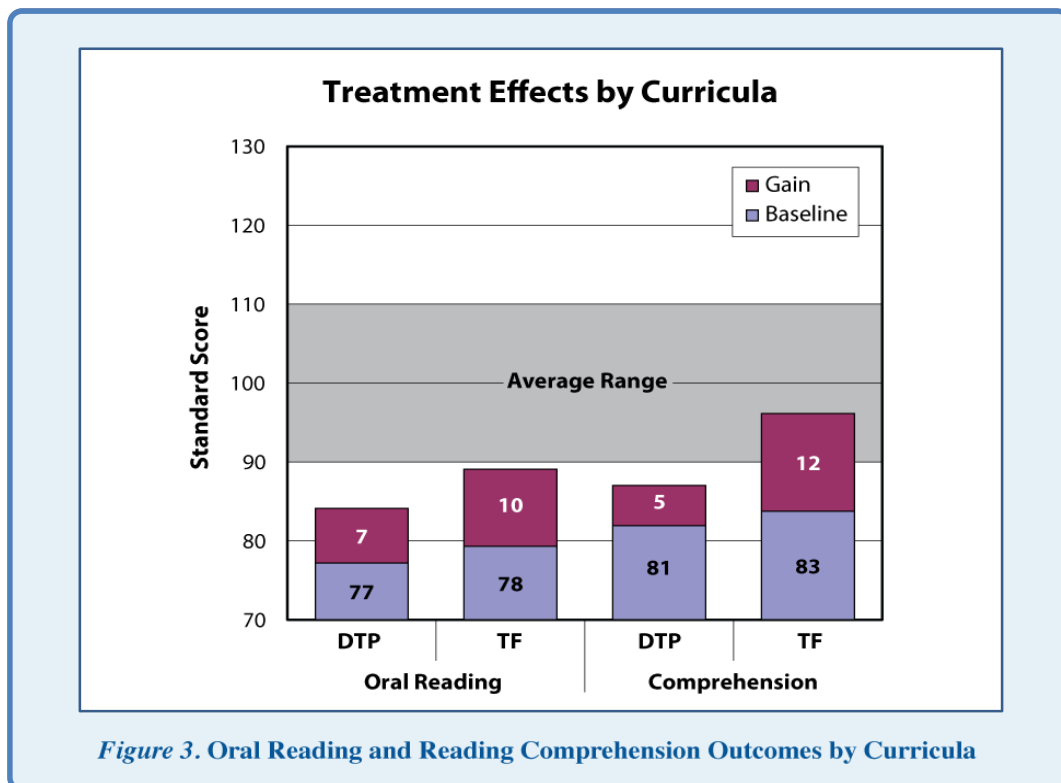
The efficacy of the *Take Flight* curriculum was evaluated by a comparison of reading-related development before intervention with effects during treatment. Patients in the Dyslexia Laboratory were evaluated by clinical staff of the Hospital's Center for Dyslexia and Learning Disorders and then referred for education services. The time between initial assessment and the beginning of *Take Flight* instruction, an average of nine months, provided a contrast of differences observed in the growth of important reading-related skills between a pre-treatment 'control' period and the two-year intervention. Figure 2 shows average phonological awareness² and word identification⁴ standard scores from the sample of students in the Dyslexia Lab. Similar results were observed for word decoding skills.



- **Baseline data indicate little growth in reading and related skills before treatment.**
- **Significant improvements in reading skills were then observed with *Take Flight* treatment**
- **Together, these results document the efficacy of the *Take Flight* instruction compared with no systematic intervention.**

Summary of Comparative Treatment Effects: *Take Flight* and the *Dyslexia Training Program*

Take Flight differs from previous curricula at the Hospital with specific instruction to develop reading fluency and comprehension. Figure 3 shows data from standardized measures of oral reading⁶ and reading comprehension⁴. The figure compares data from the *Take Flight* sample to that of a historical control sample (n=25) that received the DTP treatment in the laboratory from 2000-2002⁷.



- Both samples showed improvements in both passage reading fluency and reading comprehension.
- *Take Flight* sample shows significantly larger growth in reading comprehension relative to students who received DTP instruction.

Summary of Long-Term Treatment Effects

Longitudinal data collected months or years post-treatment are needed to provide evidence that treatment outcomes are durable. Figure 4 presents word recognition⁴ and reading comprehension⁴ outcomes from 69 former students during the two-year intervention and at annual follow-up evaluations for four years after treatment.

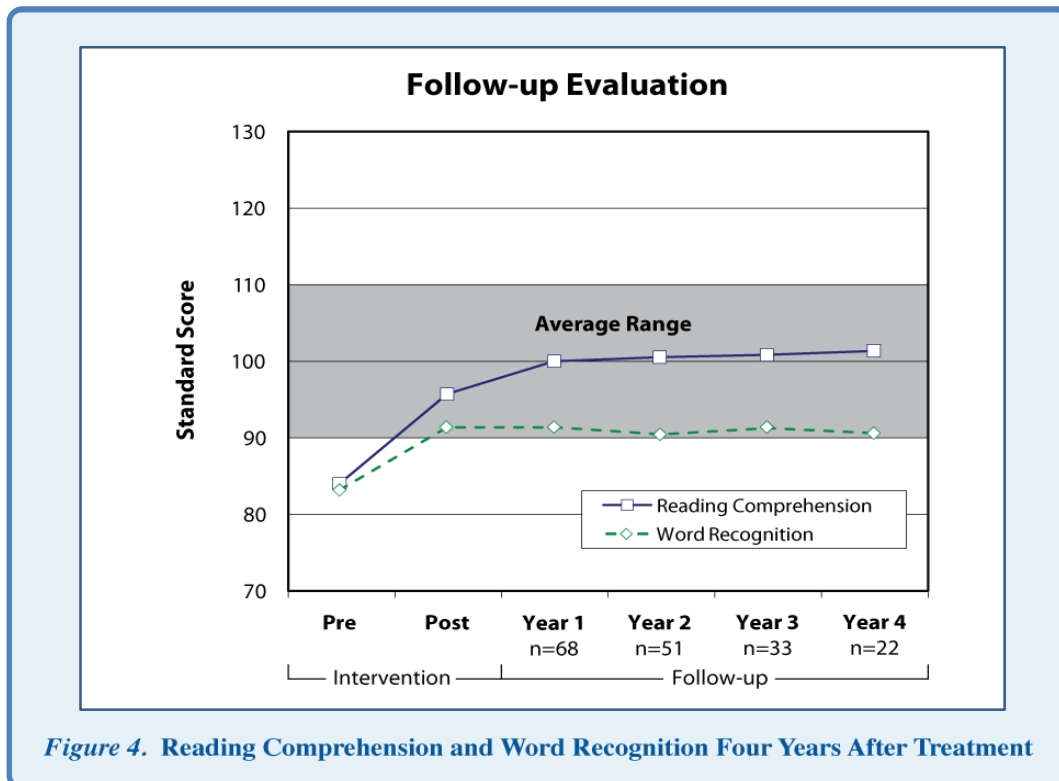
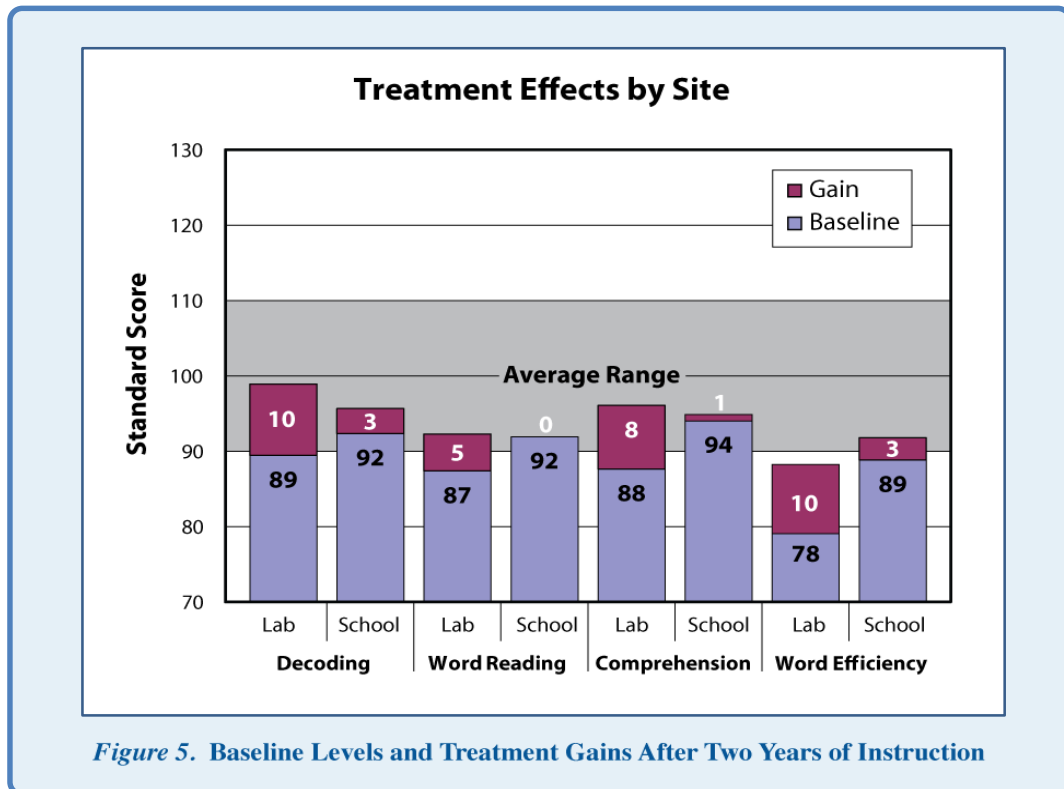


Figure 4. Reading Comprehension and Word Recognition Four Years After Treatment

- The rate of growth in reading comprehension continues for one year post-treatment, and is maintained at the population average at subsequent follow-ups.
- Word recognition growth is slower at one year post-treatment, however, the results indicate that the student's word reading continues developing at the same rate as other children of the same age.
- Treatment effects on reading comprehension and word recognition are stable up to four years after treatment.

Summary of Field Evaluations of *Take Flight* in Public Schools: School Study 1

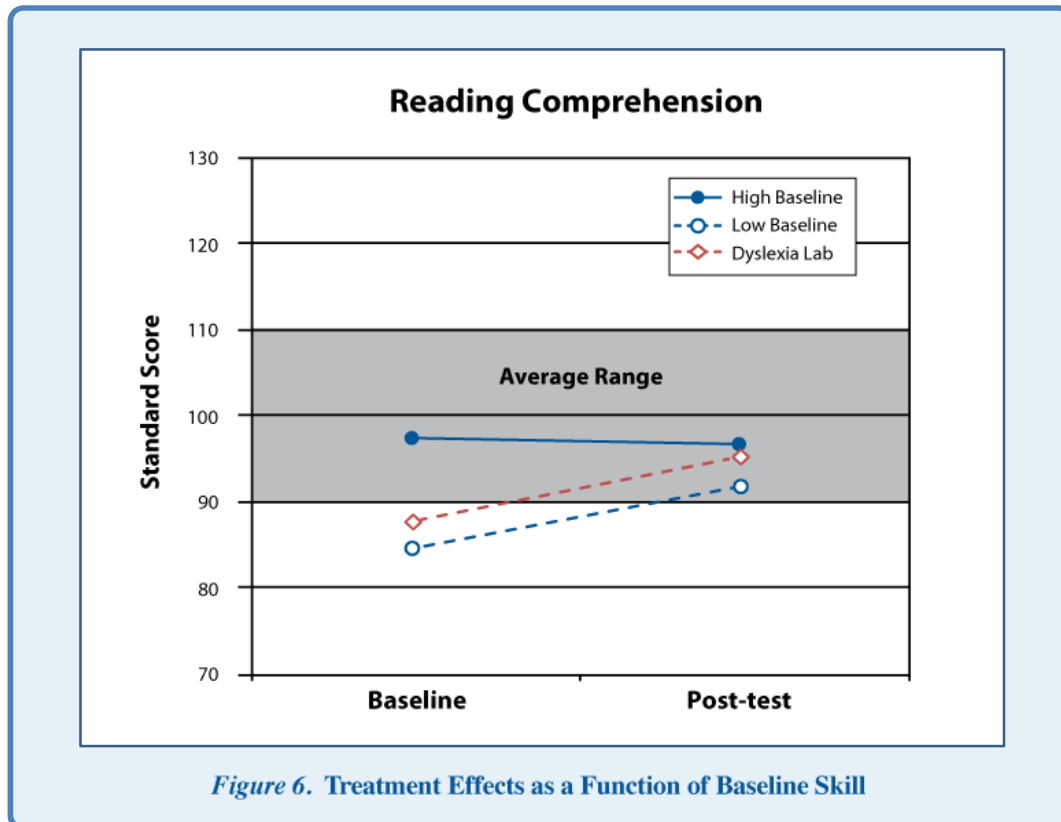
Additional data of *Take Flight* treatment effects were collected from dyslexia programs implemented in several local school districts. Fifty-nine public school students in Grades 3 through 5 were enrolled in the study. All students were identified for dyslexia services by their school districts. Instruction was delivered for two academic years by the school districts' dyslexia therapists. Figure 5 shows baseline levels and treatment gains after two years of instruction. Data from the Dyslexia Laboratory sample are added for comparison.



- School sample at baseline was significantly higher compared to the Dyslexia Laboratory sample on measures of decoding³, word recognition³, comprehension³, and word efficiency⁵.
- Treatment effects in the schools were modest compared to those in the Dyslexia Lab.
- The reading skills of the school sample were progressing at the same rate or, in some cases, faster than their same age peers after completing treatment.

Summary of Individual Differences

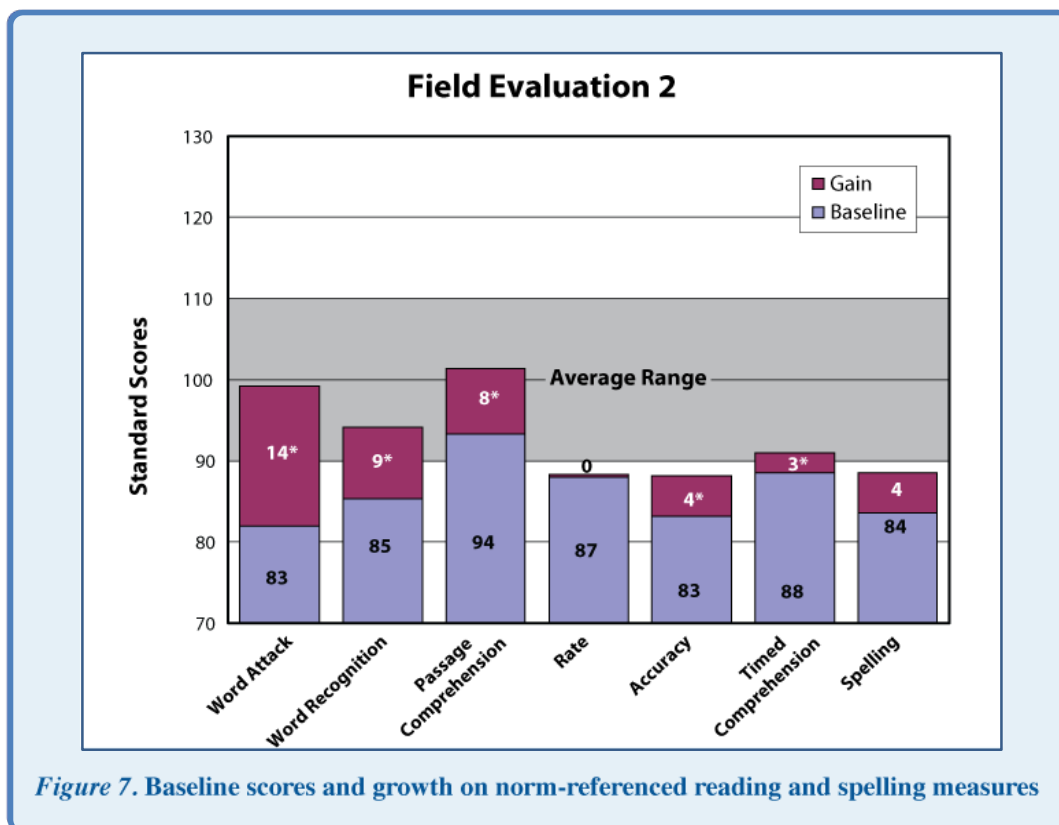
There was significant variation in baseline levels and treatment effects in the school sample. Growth curves for each individual suggested students with lower reading comprehension scores at baseline showed larger gains during treatment. Figure 6 illustrates the effect of individual differences on observed gains in passage comprehension. Data from the Dyslexia Lab is shown for comparison of treatment effects.



- **Students with below average reading comprehension ability at baseline showed significant growth in reading skill.**
- **Growth in reading comprehension was comparatively modest for students with average abilities at baseline.**
- **The gains of the below-average students were comparable to the Dyslexia Lab students on the same measure of reading comprehension. A similar pattern of outcomes was also observed for word decoding skills.**

Summary of Field Evaluations of *Take Flight* in Public Schools: School Study 2

Many of the students in the first field evaluation had reading skills in the average range, which may have limited the amount their basic word reading skills could benefit from the curriculum's lessons. A subsequent study of the effectiveness of *Take Flight* was conducted in a large suburban public school district and similarly analyzed to evaluate outcomes in a larger, more specified sample.⁸ Data from a total of 141 students in Grades 1 through 6 were included in the study. All services were provided by the school district's dyslexia program which implemented evidence-based practices in both the identification and treatment of dyslexia.



- Similar to the Dyslexia Lab results, the analyses of the school-based *Take Flight* intervention showed statistically and clinically significant growth on measures of word reading³, word decoding³, and passage comprehension.³
- Smaller but still significant gains were observed for oral text reading accuracy⁶, oral reading comprehension⁶, and spelling⁹.

General Summary and Conclusions

The Dyslexia Lab at Scottish Rite Hospital

- Students that received *Take Flight* instruction showed significant growth in all areas of reading.
- Little change in reading skills during the wait-list control period suggests improvements in reading skills are attributable to *Take Flight* instruction.
- Comparison of *Take Flight* results with a historical sample highlighted the benefit of the curriculum's added instruction in reading comprehension and, to a lesser extent, reading rate instruction.
- Follow-up data showed that *Take Flight* students maintained gains in word reading and text comprehension for four years after treatment.

Field Studies

- Two independent school studies found significant, but differential effects of *Take Flight* instruction on word reading, decoding, and reading comprehension skills.
- Combined, these studies suggest that *Take Flight* treatment effects on reading skills were similar to those seen in the Dyslexia Lab for school students who presented with significant word reading difficulties at the beginning of treatment.

End Notes

¹ More detailed discussions of these results can be found in the *Take Flight* Technical Report available on the Center's website.

² Comprehensive Test of Phonological Processing (ProEd, Inc.)

³ Woodcock Reading Mastery Test (American Guidance Services)

⁴ Wechsler Individual Achievement Test (PsychCorp).

⁵ Test of Word Reading Efficiency (ProEd, Inc.)

⁶ Gray Oral Reading Test (ProEd, Inc.) Oral Reading Quotient

⁷ DTP sample with oral reading data is 10 of 25 possible participants

⁸ Test of Written Spelling (ProEd, Inc.)

⁹ See report entitled "Growth in Student Literacy Skills When Implemented in Routine Practice," located on the Center's website.

LUKE WAITES CENTER FOR DYSLEXIA AND LEARNING DISORDERS

About the Researchers:

Sheryl Frierson, M.D., medical director
Anna Middleton, Ph.D., research scientist
Jeremiah Ring, Ph.D., research scientist
Jeffrey Black, M.D., medical director emeritus

Take Flight Authors:

Lead Author:

Karen Avrit, M.Ed., director of dyslexia education

Contributing Authors:

Clayton Allen, M.A.
Kathleen Carlsen, M.Ed.
Maria Gross, M.Ed.
Debra Pierce
Mary Rumsey, M.Ed.

Special thanks to Gladys Kolenovsky, M.A., administrative director, and Elizabeth Cantrill, M.Ed., for their guidance, direction and support.

The publication of Take Flight was made possible, in part, by the generous support of Ronald L. Carter; Karen and Rob Lange, Monotype, LLC; Winfield Padgett, Padgett Printing; Carl B. & Florence E. King Foundation; George and Fay Young Foundation, Inc.; San Marcos Civic Foundation; and The Moody Foundation.

The Luke Waites Center for Dyslexia and Learning Disorders at Texas Scottish Rite Hospital for Children provides one of the most comprehensive programs for childhood learning disorders in the nation. Founded by Dr. Lucius Waites in 1965, the center is dedicated to serving children through innovative evaluation, treatment and education, as well as extensive outreach, educator and physician training programs and research.

For more information, please call 214-559-7816 or 800-421-1121, ext. 7816 or visit scottishritehospital.org/care-and-treatment/dyslexia

Scottish Rite for Children is one of the nation's leading pediatric orthopedic centers. The hospital treats a wide range of orthopedic conditions, including sports injuries and fractures, as well as certain arthritic, neurological and learning disorders, such as dyslexia. Patients receive treatment regardless of the family's ability to pay. For more information about services available at our Dallas or Frisco campus, volunteering or donating, visit scottishritehospital.org.

SCOTTISH RITE

